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Description

Title

Method for generating a group of page files formatted  
in a page markup language

5 Back Ground of the Invention

The drawing up as well as the maintaining and availability of information, in particular of information relating to system processes and their illustration and logging, are gaining increasing importance primarily in the field of industry. In the scope of so-called management systems with which all product-related processes and structures in a plant or organization unit are defined, it is necessary to be able to make changes in existing processes, in their sequencing in their structuring as well as in control systems and subject descriptions in the most uncomplicated possible way, and to make the changed or freshly drawn up paperwork available as a document for all co-workers.

It is generally regarded as advantageous in this context if, when a new document is being drawn up, it is possible to resort to existing documentation or parts thereof. For example, documentation describing generally applicable regulations, defining standardized procedures or procedures specific to operating systems, or containing a similar representations which have already been drawn up, may be or need to be contained in a new document.

In order to meet these requirements and in order, in particular, to make changed or newly drawn up documents available to the relevant individuals as quickly as possible, information collation and storage supported by data processing techniques as well as data transmission via a private, for example in-house data network have been proposed.

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Summary of the Invention

The object of the present invention is to provide a method with whose aid a structured document can be drawn up from existing documentation and made available to the greatest possible number of individuals while placing little demand on the data network and requiring little storage capacity.

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A1 > This object is achieved according to the invention by the features of patent claim 1.

One essential advantage of the present invention, amongst others, consists in the physical separation of the original data drawn up by the author from the recovered data made available to the user via the data networking system. This means, in particular, that the original data cannot be overwritten by a user.

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15 The method according to the invention also allows optimum control over access rights between author and user.

Another advantage of the method according to the invention can be found in that, through the decoupling of original data and recovered data, the format generator device acts as a coupling component which makes it possible to use different hardware platforms as a basis and provides substantial independence from particular hardware characteristics.

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25 A2 > Advantageous refinements of the invention are given in the subclaims.

An illustrative embodiment of the invention will be explained in more detail below with reference to the drawing, in which:

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Figure 1 shows a schematic representation of a data networking system with a data server device;

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a Figure 2 shows a symbolic representation of files stored in an authoring system and in a server device;

a Figure 3 shows relevant data fields for drawing up an author file;

a Figure 4 shows a register drawn up by a format generator device for a file, in particular to determine navigation control addresses.

Description of the preferred embodiments.

10 Figure 1 gives a greatly simplified symbolic representation of a data networking system INTERNET. A multiplicity of DP user systems DV1,...,DVn can be connected directly, or with the interconnection of other data networking systems, to a data server device  
15 SERVER; likewise, a DP authoring system AUTS is connected via a data transmission line DL to the data server device SERVER. The Internet/Intranet system used worldwide is employed as the data networking system.

20 In the data server device SEVER, a great deal of documentation is stored, each item being divided into so-called pages. Documentation stored in the data server device SERVER can be addressed by all DP user systems DV1,...,DVn linked to it through, i.e. connected up to, the data networking system INTERNET.

25 To view documented information on the DP user systems DV1,...,DVn, page access devices, so-called browsers, are required on the latter which perform interpretation of control instructions contained in the pages and deliver - in accordance with the control  
30 instructions - the useful content to a display device of the DP user system. The pages are drawn up in a page markup language, e.g. the known web language HTML, whose formatting options essentially indicate what status a subset of information within a respective page

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has. The page markup language also makes it possible, with the aid of a so-called tag put in a page, to indicate links (i.e. addresses) to other pages of the documentation.

5           The DP authoring system AUTS which, like the individual DP user systems DV1,...,DVn, is formed by a personal computer contains - as essential components for the present invention - a storage device MEM and a format generator device HTML-GEN technically embodied  
10 at the programming level.

For the DP authoring system AUTS, a so-called "Home page" has been filed in the data server device SERVER, which serves as a point of reference for all documentation coming from the DP authoring system AUTS  
15 and is used by the DP user systems DV1,...,DVn as an entry address for access to the documentation drawn up by the DP authoring system AUTS.

Conventionally, the "Home page" links to a list of contents in which the individual documentation or their lists of contents are indicated. On each of the  
20 DP user systems DV1,...,DVn, with the aid of a conventional browser, it is possible to turn over via the list of contents from one page to the next or to a different page, which moreover requires relatively long waiting times and through which the networking system  
25 becomes heavily loaded.

More detailed information about the Internet/Intranet, the web language HTML, about browsers and other devices known in connection with the data networking system "Internet" can be found in the  
30 relevant literature, e.g. Russ Jones, Adrian Nye, "HTML und das World Wide Web" [HTML and the Worldwide Web], O'Reilly & Associates, Bonn, 1995.

In Figure 2, the data server device SERVER with its storage medium and the DP authoring system AUTS  
35 with its storage

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device MEM are symbolically represented. Page files SD1,...,Sdm which are stored in HTML format in the storage medium of the data server device SERVER are also illustrated. Likewise symbolically represented are

5 data record-structured files DSD1,...,DSDn which are stored in the storage device MEM. Each of the data record-structured files consists of a multiplicity of data records DS1,...,DSl which, for their part, are subdivided into data fields DF. The data record-

10 structured files DSD1,...,DSDn are also to be regarded as databases or database modules. As well as these data record-structured files, data record structure-free files TGD1,...,TGDp which are not data record-structured or have a data record structure which differs from the

15 chosen structure of the data record-structured files DSD1,...,DSDn are also stored in the storage device MEM. In particular, the data record structure-free files TGD1,...,TGDp may contain purely verbal and/or graphical documentation.

20 The figure also symbolically represents a data record-structured author file AT whose structure corresponds to that of the data record-structured files DSD1,...,DSDn. The author file AT is drawn up on the DP authoring system AUTS and is, of course, also stored,

25 in particular temporarily stored, in the storage device MEM.

For each data record DS1,...,DSl of the data record-structured files DSD1,...,DSDn, there is, in the storage medium of the data server device SERVER. an

30 associated page which will be referred to below as page files SD1,...,Sdm. In the DP authoring system AUTS, it is possible to gain read and write access to each data record DS1,...,DSl with the aid of an individual data record address DS-ADR which identifies the data record

35 file and, in the latter, the relevant data record. The page files SD1,...,Sdm have an individual HTML address HTML-ADR under which they can, in the data networking system or in

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the data server device SERVER, be addressed, i.e. found.

Figure 3 illustrates the way in which an author file AT is drawn up on the DP authoring system AUTS with the aid of data records and data fields of the author file AT. In particular, each of the data record-structured files DSD1,...,DSDn can be treated as an author file AT.

In the construction of documentation to be drawn up in the author file AT, a new data record is to be provided and, correspondingly, to be reserved for each chapter of the documentation, that is to say for each title and subtitle. The data records DS are subdivided into a multiplicity of data fields DF of which during construction a few are visible, e.g. the data field "TITLE" and the data field "USEFUL INFORMATION", but most are not visible to the creator.

In the present illustrative embodiment, when drawing up the documentation, the title of the first chapter was entered manually by the creator in the first data record - with the data record address ATDS1 which the user moreover does not see. Further, useful information belonging to this title was entered by the creator using the keyboard in the form of an item of text or graphic information "General" within the same data record.

The title of the next subchapter as well as associated useful information "History" were also entered by the creator using the keyboard. The data record Ds filled in this way has the data record address ATDS2.

The creator receives the title of the second subchapter from a list of contents of the data record-structured file DSDx, which list he gets displayed by selecting the data record-structured file DSDx in a "window" on the screen of the DP authoring system AUTS. Through corresponding

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marking of the desired chapter - as indicated in the figure by ringing the Chapter 1.2. - and after subsequent confirmation, the marked title is received, i.e. copied into the new data record with address  
5 ATDS3. Further - the creator cannot see this - the data record address DS-ADR of the marked chapter and the HTML address HTML-ADR of the data page SD, which is assigned to the data record with the address DSDx:003, is stored.

10 Through the above-explained taking of a title from one of the data record-structured files DSD1,...,DSDn, the subchapters of the selected chapter are also implicitly taken into the documentation firstly to be drawn up or to be processed.

15 Moreover, instead of an explicitly entered item of useful information, a link address to a text or graphic file, e.g. one of the data record structure-free files TGD1,...,TGDp may be put in. Further, already existing chapters within the author file AT may also be  
20 taken to other locations in the author file AT in the manner explained. In addition, a (direct) address of a data record structure-free file TGD may also be received, although a reference is not provided in this.

After the desired documentation has been  
25 prepared by the creator through manual entry and by referencing to already existing chapters, at least within a preliminary context, the author file AT is fed to the format generator device HTML-GEN. By the latter, starting with the first data record, that is to say at  
30 the data record address ATDS1 of the author file AT, a structured list of contents (cf. top of Figure 4) is drawn up and those data records which are not yet in HTML format (in the following example the first two data records of the author file AT) are converted into  
35 this format. Further, a copy of the HTML page files generated is transmitted via the data transmission line DL to the data server device SERVER

09341207-070799

for storage there. The author file AT which has been drawn up is stored as a new data record-structured file DSDn+1 in the storage device MEM of the DP authoring system.

5           Figure 4 illustrates the drawing up of a list of contents, as was prepared by the format generator device HTML-GEN in the case of a data record-structured file, e.g. DSDx, which was drawn up beforehand.

10           Available for the user to see is a list of contents, drawn up by the format generator device HTML-GEN, with index and title indications (at the upper left of the figure), the index being a multi-position index in order to be able to express a desired structuring level of the classification of the documentation. Into this visible list of contents, are  
15           also all the subchapters of a chapter which [lacuna] been integrated, that is to say taken, by referencing - as explained in conjunction with Figure 3 regarding Chapter 1.2.

20           What the creator cannot see is the construction of register data records REG0,...,REG2 which, in particular, log a logical sequence of page files SD1,...,SDm belonging to a piece of documentation. This is intended, in particular, so that when displaying a  
25           particular page file SDy on a DP user system Dvx on navigation symbols NSY [lacuna] can be presented and activated by the viewer on their DP user system in order to make it possible to turn over (leaf through) to the logical next or previous page within the  
30           structure of the documentation. The navigation symbols NSY are intended in particular to allow the viewer on a DP user system to call up the next or previous page file in logical sequence, without needing not to activate the browser function which - as already  
35           mentioned in the introduction - accesses a page through the list of contents.

09341207-070799



As navigation symbols NSY, a right arrow is indicated, which symbolizes turning over to the logically next page, and an up arrow is indicated, which symbolizes turning back to the previous page. The HTML address of the logically next page in the documentation and the HTML address of the logically preceding page are respectively stored associated with the navigation symbols NSY of a particular page.

For rapid determination of the logically next or preceding page address of a particular page, the register data records RG0,...,RG2 are drawn up by the format generator device HTML-GEN. The first register data record RG0 has two records, in which the titles of the hierarchically top level (level 0), that is to say the main titles of the documentation in question, are stored. The register data record RG1 similarly contains the titles of the chapters located at the next highest hierarchical level (level 1), and the register data record REG2 contains the titles of the hierarchical level 2.

In addition to a data field for the title, the register data records REG0,...,REG2 have other data fields, e.g. for the index allocated to the title, for the data record address DS-ADR of the data record DS belonging to the title in the DP authoring system AUTS and for the HTML address under which the page file SDy belonging to the title in question can be addressed.

In another first data field - if appropriate - the address of the register record in which the logically next title is stored is indicated. In another second data field - if appropriate - the address of the register record in which the logically preceding title is stored is indicated. The addresses indicated are thus used as a link to data records of the register data records RG0,...,RG2.

09341207-070799

On the basis of the hierarchical structure, indicated by way of example, of the list of contents SIV represented in the upper left-hand part of Figure 4, and therefore of the documentation, the first chapter has the title "TITLE-A". The page file SDy assigned to this logically first data record of the data record-structured file DSDx is likewise the logically first page file of the documentation and can be addressed under the HTML address XB. The next title in logical sequence belongs to Chapter 1.1. and, because of the lower hierarchical level, is stored in the register data record RG1 (under address 10). The page file SD belonging to this title (Title-A1) can be reached under the HTML address XA.

The next chapter in logical sequence in the documentation carries the title "Title-A2" and has the Index 1.2. The title is thus, because it has the same hierarchical level as the one before it, stored in the register data record REG1 (under the address 11). The following title in logical sequence "Title-A2A" is put under the address 20 in the register data record REG2 (for the hierarchical level 2). The page file SD belonging to this title (Title-A2A) can be addressed under the HTML address XD. The next title in logical sequence can in turn be found in the same register data record REG2 under the address 21 (TITLE-A2B). The previous title in logical sequence (relative to title "TITLE-A2A") is to be found in the register data record REG1 under the address 11. If the register data records REG0,...,REG2 are constructed in the same way, then the navigation symbols NSY with the corresponding HTML addresses for the logically subsequent or logically preceding page file, respectively, can be determined very quickly and straightforwardly and given to the page file SD in question. The HTML addresses of the logically subsequent and preceding page files are thus entered in the page in question and then sent as a component of it to the data server device SERVER.

09341207-070799

In the present example, only one navigation symbol NSY for turning over to the logically next page file, whose HTML address is XA, is put in the page with the HTML address XB. There is no navigation symbol to the preceding page because the chapter represents the start of the documentation. In the page file SD with the HTML address XA, the HTML address XC is stored under the navigation symbol NSY to the subsequent page, and the HTML address XB to the preceding page. In order to avoid transmission of page files which are already stored in the data server device SERVER, but whose HTML addresses have been changed to address a logically next or preceding page file SD, the register data records REG0,...,REG2 may be stored in the data server device SERVER, the HTML address of the logically next and preceding page files with respect to a page file in question being determined through a link from the register data records REG0,...,REG2.

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